SUBWAVELENGTH CONFINEMENT AND PROPAGATION IN A TWO-LAYER SILVER FILM WITH ANGLED HOLES: A NUMERICAL STUDY

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Light confinement and propagation at optical frequencies is numerically investigated for a two-layer silver film with periodic angled holes. Confinement and propagation of light below the diffraction limit is necessary for the development of waveguides as components in novel optical devices. 1 and 2-dimension spatial confinement can be achieved for distances between layers as small as 10nm with propagation distances up to 10μm. The angled perforation of the holes allows for light to be selectively propagated depending on the wavelength of incident light. Increasing the number of holes increases the amount of propagating light without increasing waveguide dimensions. The high directional selectivity, propagation and 2-dimensional confinement of light by the two-layer film would provide useful information for subwavelength waveguide design.